NASA Glenn Success Stories

Art Restoration Application for Atomic Oxygen

St. Stanislaus Church

TECHNOLOGY

Very fine texturing of organic surfaces or removal of organic layers can be accomplished with low-energy oxygen atoms. If the organic layer is on paint or another surface that is less reactive, the organic layer can be preferentially removed. This technique was used to restore paintings damaged by a fire in the rectory of St. Stanislaus Church.

Section of smoke damaged wall paper from St. Stanislaus church with strips cleaned using atomic oxygen restoration. The wall paper was used as a calibration standard for the amount of cleaning to be used on paintings damaged by smoke from a fire.

COMMERCIAL APPLICATION

◆ **Medical**
Increased cellular attachment to implants stimulation
Improved fixation of orthopedic implants

◆**Industrial**
Improve polymer handling, alter wetability
Reduce or increase friction, increase heat transfer
Improve adhesive bonding, improve paintability

◆**Art Restoration and Cleaning**
Removal of soot, varnishes, urethanes, graffiti, finger prints and other organic contaminants

SOCIAL / ECONOMIC BENEFIT

◆Minimally disturbing to pigments

◆Requires no physical contact with the surface

◆Can improve radiative heat transfer by a factor of 8 to 10

◆Allows precise control of exposure

◆Can be scaled-up to meet most processing needs

NASA APPLICATIONS

◆Technology developed simulation of the low Earth orbital space environment has made it possible to alter the surface of many materials through texturing.

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